

Listing Of The Claims

1. (Currently Amended) A data management system in a computing environment comprising:

- a. a data instance centric architecture; a plurality of common, fundamental data structures, each of said common fundamental data structures encapsulating a single data instance;
- b. ~~where each data instance is encapsulated in a common fundamental data structure; and~~
- e. ~~where~~ each of said common fundamental data ~~structure~~ structures also ~~encapsulates~~ encapsulating references to other common fundamental data structures encapsulating associated ~~separately encapsulated~~ data instances[.]; and
- c. wherein said plurality of common fundamental data structures are stored on a computer-readable media in non-tabular form.

2. (Cancelled)

3. (Original) The data management system of claim 1 wherein a first data instance is encapsulated with references to associated data instances and each of said associated data instances are separately encapsulated with a reference to said first encapsulated data instance.

4. (Cancelled)

5. (Currently Amended) The data management system of claim 1 wherein:

a first data instance is encapsulated with references to associated data instances and each of said associated data instances are separately encapsulated with a reference to said first encapsulated data instance;

wherein each of said encapsulated references is a logical index which uniquely identifies each of said associated encapsulated data instances and also encodes the location of each of said associated encapsulated data instances on said computer-readable media; and

wherein said logical index is 'm' dimensional, and has 'n' bits per dimension.

6. (Cancelled)

7. (Original) The data management system of claim 1 wherein:

said encapsulated references are in at least one dimensions; and

each of said at least one dimensions corresponds to a type of association.

8. (Original) The data management system of claim 7 wherein each of said at least one dimensions has a plurality of said encapsulated references.

9. (Currently Amended) The data management system of claim 1 wherein ~~the~~ said common fundamental data ~~structure is~~ structures are application independent and is generally the same for all of said data instances.

10. (Cancelled)

11. (Currently Amended) The data management system of claim 3 wherein ~~the~~ said common fundamental data ~~structure is~~ structures are application independent and is generally the same for all of said data instances.

12. (Cancelled)

13. (Currently Amended) The data management system of claim 5 wherein ~~the~~ said common fundamental data ~~structure is~~ structures are application independent and is generally the same for all of said data instances.

14. (Cancelled)

15. (Original) The data management system of claim 7 wherein ~~the~~ said common fundamental data ~~structure is~~ structures are application independent and is generally the same for all of said data instances.

16. (Currently Amended) The data management system of claim 8 wherein ~~the~~ said common fundamental data ~~structure is~~ structures are application independent and is generally the same for all of said data instances.

17. (Original) The data management system of claim 1 wherein at least one of said encapsulated references is a reference to an encapsulated data instance in another computing environment.

18. (Currently Amended) The data management system of claim 1 wherein ~~said~~ the encapsulated references of at least one of said encapsulated data instances are unique and ~~said~~ the encapsulated references of at least two of said encapsulated data instances are generally identical.

19. (Currently Amended) The data management system of claim 1 ~~wherein said data instance centric architecture includes~~ including a plurality of pre-existing encapsulated data instances, ~~and said plurality of pre-existing encapsulated data instances have~~ having established associations, and wherein at least one new encapsulated data instance is associated with at least one of said pre-existing encapsulated data instances.

20. (Currently Amended) The data management system of claim 1 ~~wherein: said data instance centric architecture includes~~ including a plurality of pre-existing encapsulated data instances; ~~said encapsulated data instances have~~ having established associations[;], ~~and~~ wherein any of said pre-existing encapsulated data instances can be removed and disassociated from other pre-existing associated encapsulated data instances.

21. (Currently Amended) The data management system of claim 1 ~~wherein: said data instance centric architecture includes~~ including a plurality pre-existing encapsulated data instances; ~~said encapsulated data instances having~~ established associations[;], wherein new associations between at least two pre-existing encapsulated data instances can be added.

22. (Currently Amended) The data management system of claim 1 ~~wherein: said data instance centric architecture includes~~ including a plurality of pre-existing encapsulated data instances; ~~said encapsulated data instances having~~ established associations[; and], wherein ~~some~~ any of said pre-existing associations between said pre-existing encapsulated data instances can be removed.

23. (Currently Amended) The data management system of claim 1 further comprising[:]
a search capability for finding specific unknown encapsulated data instances from a selection criteria of known encapsulated data instances by accessing said known encapsulated data instances representing said selection criteria
comprising the steps of:[:]

accessing references encapsulated with said known encapsulated data instances
representing said selection criteria;
using Boolean operations to compare said accessed encapsulated references to find
references to said specific unknown encapsulated data instances; and
retrieving said specific unknown encapsulated data instances.

24. (Currently Amended) The data management system of claim 23 wherein[:]
said encapsulated references are embodied as logical indexes in a plurality of dimensions[:],
each of said dimensions ~~corresponds~~ corresponding to a type of association[: and],
wherein said accessing further comprises accessing said encapsulated
references from said dimensions specified in said selection criteria.

25. (Currently Amended) The data management system of claim 23 wherein[:]
said encapsulated references are 'm' dimensional logical indexes,
each of which uniquely identifies and encodes the location of said associated
encapsulated data instances on said computer readable media[: and],
~~further comprising filtering~~ wherein said encapsulated references are filtered
by Boolean operations on at least one of said 'm' dimensional logical indexes.

26. (Currently Amended) The data management system of claim 24 wherein[:]
said encapsulated references are 'm' dimensional logical indexes,
each of which uniquely identifies and encodes the

location of said associated encapsulated data instances on said computer readable media]; and],
~~further comprising filtering wherein~~ said encapsulated references are filtered by Boolean
operations on at least one of said 'm' dimensional logical indexes.

27. (Previously Presented) The data management system of claim 23 wherein said Boolean
operations further comprise:

basic mathematical operators which result in the direct exclusion of at least one
encapsulated reference from the result of said comparing in a single operation.

28. (Previously Presented) The data management system of claim 24 wherein said Boolean
operations further comprise:

a basic mathematical operator which results in the direct exclusion of at least one
encapsulated reference from the result of said comparing in a single operation.

29. (Previously Presented) The data management system of claim 25 wherein said Boolean
operations further comprise:

a basic mathematical operator which results in the direct exclusion of at least one
encapsulated reference from the result of said comparing in a single operation.

30. (Previously Presented) The data management system of claim 26 wherein said Boolean
operations further comprise:

a basic mathematical operator which results in the direct exclusion of at least one
encapsulated reference from the result of said comparing in a single operation.

31. (Original) The system of claim 1 wherein said encapsulated data instances have attributes of a user interface.

32. (Original) The system of claim 31 wherein said attributes of a user interface are selected from a group of user views, display elements, and data access methods.

33. (Currently Amended) The system of claim 1 further comprising searching said system wherein ~~said~~ the encapsulated references of two or more different ~~said~~ encapsulated data instances are used to derive desired results.

34. (Currently Amended) The system of claim 33 wherein said encapsulated references of two or more different ~~said~~ encapsulated data instances are compared ~~such~~ for at least one of commonality, similarity and difference to derive sets of references corresponding to said desired results.

35. (Currently Amended) The system of claim 34 wherein said encapsulated references of two or more different ~~said~~ encapsulated data instances are stored in an order based on value and are compared ~~such~~ for at least one of commonality, similarity and difference to derive sets of references corresponding to said desired results.

36. (Currently Amended) The system of claim 33 wherein:

a first data instance is encapsulated with references to associated data instances and each of said associated data instances are separately encapsulated with a reference to said first encapsulated data instance;

wherein each of said encapsulated references is a logical index which uniquely identifies each of said associated encapsulated data instances and also encodes the location of each of said associated encapsulated data instances on said computer readable media; and

wherein said logical index is 'm' dimensional, and has 'n' bits per dimension; said the encapsulated references of two or more different said encapsulated data instances are ~~used by comparing such~~ compared for at least one of commonality, similarity and difference to derive sets of references corresponding to said desired results.

37. (Currently Amended) The system of claim 33 wherein:

each of said at least one dimensions has a plurality of said encapsulated references; and

said encapsulated references of two or more different ~~of said~~ encapsulated data instances are stored in an order based on value and are compared for at least one of commonality, similarity and difference to derive sets of references corresponding to said desired results.

38. (Cancelled)

39. (Cancelled)

40. (Currently Amended) The system of claim 1 further comprising:

a plurality of encapsulated data instances representing ASCII characters;
said common fundamental data structures containing said encapsulated data instances representing ASCII characters also ~~contain~~ containing encapsulated references to encapsulated data instances ~~containing~~ using one or more of said ~~corresponding~~ ASCII characters; and
said common fundamental data structures containing ~~said~~ encapsulated data instances ~~containing~~ using one or more of said ~~corresponding~~ ASCII characters also ~~contains~~ containing encapsulated references to said encapsulated data instances representing said used ~~corresponding~~ ASCII characters.

41. (Currently Amended) The system of claim 40 wherein said encapsulated references with a given ASCII character data instance ~~are references~~ refer to other encapsulated data instances ~~containing~~ using said ASCII characters based on the position of said given ASCII ~~characters~~ character in the sequence of ~~occurrence of~~ said ASCII characters in said encapsulated data instances.

42. (Currently Amended) The system of claim 1 further comprising:

said a plurality of encapsulated data instances representing Unicode characters;
said common fundamental data structures containing said encapsulated data instances representing Unicode characters also ~~contain~~ containing encapsulated references to

encapsulated data instances ~~containing~~ using one or more of said ~~corresponding~~ Unicode characters; and

said common fundamental data structures ~~containing~~ encapsulated data instances using one or more of said ~~encapsulated data instances representing~~ Unicode characters also contains encapsulated references to said data instances representing ~~corresponding~~ said used Unicode characters.

43. (Currently Amended) The system of claim 42 wherein said encapsulated references with a given Unicode character data instance ~~are references~~ refer to other data instances ~~containing~~ using said Unicode characters based on the position of said given Unicode characters in the sequence of ~~occurrence of~~ said Unicode characters in said encapsulated data instances.

44. (Currently Amended) The system of claim 1 ~~wherein~~ further comprising:

said a plurality of encapsulated data instances ~~comprise~~ encapsulated data instances representing the tokens of a token set of any data type;

said common fundamental data structures containing said data instances representing said tokens ~~a token set of any data type~~ also ~~contain~~ containing encapsulated references to encapsulated data instances ~~containing~~ using one or more of said ~~corresponding token set of any data type~~ tokens; and

said common fundamental data structures containing ~~said~~ encapsulated data instances ~~representing token set of any data type~~ using one or more of said tokens also ~~contains~~ containing encapsulated references to ~~said~~ encapsulated data instances representing ~~corresponding token set of any data type~~ said used tokens.

45. (Currently Amended) The system of claim 44 wherein said encapsulated references for a given token ~~set of any data type~~ data instance ~~are references~~ refer to other encapsulated data instances ~~containing~~ using said token ~~set of any data type~~ based on the position of said given token ~~set of any data type~~ in the sequence of ~~occurrence of said token set of any data type~~ tokens in said encapsulated data instances.

46. (Currently Amended) The system claim 45 wherein:

said token set is selected from a group consisting of a set of graphic descriptors, a set of colors, a set of shapes, a set of glyphs, a set of waveforms, a set of frequency values, a set of audio frequency values, a defined set of symbols, and real numbers.

47. (Original) The data management system of claim 1 wherein:

the common fundamental data structure is application independent and is generally the same for all of said data instances;

finding specific unknown encapsulated data instances from a selection criteria of known encapsulated data instances by accessing known encapsulated data instances representing said selection criteria;

accessing references encapsulated with said known encapsulated data instances representing said selection criteria;

using Boolean operations to compare said accessed encapsulated references to find references to said specific unknown encapsulated data instances; and

retrieving said specific unknown encapsulated data instances.

48. (Original) The system of claim 47 further comprising searching said system wherein said encapsulated references of different said encapsulated data instances are used to derive desired results.

49. (Currently Amended) The data management system of claim 1 wherein:

at least one of said encapsulated references is a reference to a an encapsulated data instance in another computing environment; and

a first data instance is encapsulated with references to associated data instances and each of said associated data instances are separately encapsulated with a reference to an encapsulated data instance.

50. (Original) The data management system of claim 1 wherein:

said encapsulated references of at least one of said encapsulated data instances is unique and said encapsulated references of at least two of said encapsulated data instance are generally identical;

finding specific unknown encapsulated data instances from a selection criteria of known encapsulated data instances by accessing known encapsulated data instances representing said selection criteria;

accessing references encapsulated with said known encapsulated data instances representing said selection criteria;

using Boolean operations to compare said accessed encapsulated references to find references to said specific unknown encapsulated data instances; and

retrieving said specific unknown encapsulated data instances.

51. (Original) The data management system of claim 1 wherein:

said encapsulated references of at least one of said encapsulated data instances is unique and said encapsulated references of at least two of said encapsulated data instance are generally identical; and

searching said system wherein said encapsulated references of different said encapsulated data instances are used to derive desired results.

52. (Currently Amended) A data management system in a computing environment comprising:

~~a data instance centric architecture;~~

~~where each data instance is encapsulated in a~~ plurality of common, fundamental data structure structures, each encapsulating a single data instance;

where each of said common, fundamental data ~~structure structures~~ also encapsulates references to associated, separately encapsulated data instances;

wherein said plurality of common fundamental data structures are stored on a computer-readable media in non-tabular form;

~~a first data instance is encapsulated with references to associated data instances and each of said associated data instances are separately encapsulated with a reference to said first encapsulated data instance;~~

wherein each of said encapsulated references is a logical index which uniquely identifies each of said associated encapsulated data instances and also encodes the location of each of said associated encapsulated data instances on said computer-readable media; and

wherein said logical index is 'm' dimensional, and has 'n' bits per dimension; ~~and,~~
said encapsulated references are in at least one dimensions[:]; and
each of said at least one dimensions corresponds to a type of association.

53. (Currently Amended) The data management system of claim 52 wherein ~~the~~ each of said
common fundamental data ~~structure is~~ structures are application independent and is generally the
same for all of said data instances.

54. (Currently Amended) The data management system of claim 53 further comprising[:]; a search
capability for finding specific unknown encapsulated data instances from a selection criteria of
known encapsulated data instances by accessing known encapsulated data instances representing
said selection criteria comprising the steps of[:];

accessing references encapsulated with said known encapsulated data instances
representing said selection criteria;
using Boolean operations to compare said accessed encapsulated references to find
references to said specific unknown encapsulated data instances; and
retrieving said specific unknown encapsulated data instances.

55. (Currently Amended) The system of claim 54 ~~further comprising searching said system~~ wherein
said encapsulated references of two or more different said encapsulated data instances are used to
~~derive desired results~~ find said specific unknown encapsulated data instances.

56. (Original) The data management system of claim 55 wherein at least one of said encapsulated references is a reference to a encapsulated data instance in another computing environment.

57. (Original) The data management system of claim 56 wherein said encapsulated references of at least one of said encapsulated data instances is unique and said encapsulated references of at least two of said encapsulated data instances are generally identical.

58. (Original) The system of claim 57 further comprising searching said system wherein said encapsulated references of different said encapsulated data instances are used to derive desired results.

59. (Currently Amended) The data management system of claim 52 further comprising[:]
a search capability for finding specific unknown encapsulated data instances from a selection criteria of known encapsulated data instances by accessing known encapsulated data instances representing said selection criteria comprising the steps of[:]

- accessing references encapsulated with said known encapsulated data instances representing said selection criteria;
- using Boolean operations to compare said accessed encapsulated references to find references to said specific unknown encapsulated data instances; and
- retrieving said specific unknown encapsulated data instances.

60. (Currently Amended) The system of claim 52 ~~further comprising searching said system~~ 59 wherein said encapsulated references of two or more different said encapsulated data instances are used to ~~derive desired results~~ find said specific unknown encapsulated data instances.

61. (Original) The data management system of claim 52 wherein at least one of said encapsulated references is a reference to a encapsulated data instance in another computing environment.

62. (Original) The data management system of claim 52 wherein said encapsulated references of at least one of said encapsulated data instances is unique and said encapsulated references of at least two of said encapsulated data instance are generally identical.

63. (Withdrawn) A method to coordinating physical memory addressing and logical memory addressing in an encapsulated data instance centric architecture comprising:

corresponding to each encapsulated data instance there is a logical reference to said encapsulated data instance;

encapsulating said logical reference to said encapsulated data instance in a first container;

relating said logical reference in said first container with a physical reference to a location where said encapsulated data instance is stored in a physical storage medium;

encapsulating said physical reference in a second container; and

relating said physical reference in said second container with said logical reference to said encapsulated data instance in said first container.

64. (Withdrawn) The method of claim 63 wherein said container is a fundamental data structure.

65. (Withdrawn) The method of claim 63 wherein said physical reference is 'n' dimensional, the number of dimensions and the number of bits in each dimension correspond to the structure of said physical storage medium.

66. (Withdrawn) The method of claim 65 wherein using said physical reference to calculate an address in said physical storage medium.

67. (Withdrawn) The method of claim 63 further comprising:
coordinating a plurality of data instances; and
encapsulating a plurality of said logical references and a plurality of said physical references in respective said first and second containers.

68. (Withdrawn) The method of claim 63 further comprising sorting said plurality of said logical references in said first containers.

69. (Withdrawn) The method of claim 68 further comprising sorting said plurality of said physical references in said second containers.

70. (Withdrawn) A method for managing data storage in a data instance centric architecture having a plurality of variable length data instances comprising:

storing said data instances generally sequentially in a physical storage medium;
storing each data instance in a respective allocated space;

updating one of said data instances;
integrating said updated data instance into said physical storage medium by determining the amount of physical space that is needed to store said updated data instance;
when said physical space is equal to or less than said respective allocated space then storing said updated data instance in the said respective allocated space;
when said physical space is greater than said respective allocated space then identifying at least one physically adjacent data instance having an aggregate allocation space equal to or greater than the difference between said physical space and said respective allocated space;
and
writing the said updated data instance to said physical storage medium at an updated location based on the size and number of said adjacent data instances.

71. (Withdrawn) The method of claim 70 for managing data storage further comprising:

writing the said updated data instance to said physical storage medium in an updated respective allocated space based on the size and number of said adjacent data instances.

72. (Withdrawn) The method of claim 70 for managing data storage further comprising:

moving said at least one physically adjacent data instance to a location after a last stored data instance; and
writing the said updated data instance to said physical storage medium to a location of said at least one physically adjacent data instance and said respective data instance.

73. (Withdrawn) The method of claim 70 for managing data storage further comprising:

moving said at least one physically adjacent data instance to a location after a last stored data instance; and

writing the said updated data instance to said physical storage medium in an updated allocation space equal to the aggregate of said respective allocated space and the allocated space of the said moved at least one physically adjacent data instances.

74. (Withdrawn) The method of claim 73 for managing data storage wherein the said updated allocation space is greater than the said physical space of the said updated data instance.

75. (Withdrawn) The method of claim 70 for managing data storage wherein said at least one physically adjacent data instance occur sequentially after said updated data instance.

76. (Withdrawn) The method of claim 70 for managing data storage wherein said at least one physically adjacent data instance occur sequentially before said updated data instance.

77. (Withdrawn) The method of claim 70 for managing data storage wherein said at least one physically adjacent data instance occur sequentially both before and after said updated data instance.

78. (Withdrawn) The method of claim 70 for managing data storage wherein:

whichever of said at least one physically adjacent data instance has an allocated space that is closest to and greater than the said difference between said physical space and said respective allocated space of the said updated data instance the said at least one

physically adjacent data instance is moved to a location after a last stored data instance;

writing the said updated data instance to said physical storage medium to a location of said at least one physically adjacent data instance and said respective data instance;

and

writing the said updated data instance to said physical storage medium in an updated allocation space equal to the aggregate of said respective allocated space and the allocated space of the said moved at least one physically adjacent data instances.

79. (Withdrawn) The method of claim 70 for managing data storage wherein when said physical space of said updated data instance is less than the allocated space of said at least one physically adjacent data instance then the updated data instance is moved to a location after a last stored data instance.

80. (Withdrawn) The method of claim 79 for managing data storage wherein the said respective allocated space of the said moved updated data instance is added to the allocated space of the physically adjacent data instance sequentially before said updated data instance.

81. (Withdrawn) The method of claim 70 for managing data storage wherein at least one of said allocated space is greater than the size of the respective data instance.

82. (Currently Amended) A method to convert a non-data instance centric database to a data instance centric database comprising:

creating encapsulated data instances in said data instance centric database representing elements of said non-data-instance centric database schema and data elements of said non-data-instance centric database;

creating associations amongst the said data instances in said data instance centric database representing the relationships between said data elements and said schema elements of the non-data-instance centric database; and

storing said associations as a reference to each associated data instance stored within a common fundamental data structure encapsulating the associated data instances, which are stored in non-tabular form on a computer-readable media. ~~each associated encapsulated data instance.~~

83. (Original) The method of claim 82 wherein said converting is through a software agent which is a data instance in said data instance centric database.

84. (Original) The method of claim 82 wherein said non-data instance centric database includes a flat file.

85. (Currently Amended) A data management system comprising:

one or more items;

wherein each of said items encapsulates a data instance; ~~and~~

wherein items which are associated with each other encapsulate mutual references to each other[.]; and

wherein said items are stored in non-tabular form on a computer-readable media.

86. (Original) The data management system of claim 85 wherein each of said items is represented in a fundamental data structure.

87. Original) The data management system of claim 85 wherein each of said items has a unique reference associated therewith.

88. (Currently Amended) The data management system of claim 87 wherein said unique reference also serves as an index to physically locate said data instance associated with each of said items on said computer-readable media.

89. (Original) The data management system of claim 85 wherein said references to associated items are arranged in sets defining the type of association between said item and each of said other items referenced in said set.

90. (Original) The data management system of claim 87 wherein each of said references is an "m" dimensional index, each of said dimensions being "n" bits in length.

91. (Original) The data management system of claim 90 wherein "m" is 4 and "n" is 30.

92. (Original) The data management system of claim 85 wherein said items may act as containers for one or more other member items.

93. (Original) The data management system of claim 92 wherein membership of an item within a container item is indicated by an identity in one or more of said "m" dimensions in said logical index of said container item and each of said member items.

94. (Original) The data management system of claim 85 wherein each of said items may encapsulate embedded elements.

95. (Original) The data management system of claim 94 wherein said embedded elements are references to other items.

96. (Original) The data management system of claim 85 wherein said data instances may contain data of any type.